15¢
$5.50 A YEAR

February 26, 1955

VOL. 67, NO. 9 PAGES 129-144

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Man-Made Diamond

See Page 131

A SCIENCE SERVICE PUBLICATION

ELECTRONICS

TV From Abroad?

Experts fear that television programs from foreign countries may interfere with reception here during the coming sunspot cycle.

➤ TELEVISION SETS in the United States may soon start picking up flickering, ghostly pictures and voices speaking foreign languages.

These interfering signals will be television programs from foreign countries.

The reason is the sun is beginning to act up again in its regular 11-year cycle that affects shortwave transmission. Television signals are just above the shortwave band. But when solar activity is high they can, like short waves, be picked up over immense distances.

The greatest interference is expected to be on the low-numbered channels. Many foreign countries, including Mexico, Puerto Rico, Britain, Belgium, Germany, Spain, Switzerland, Brazil and Argentina, televise programs in this low range that may be picked up here when atmospheric conditions are right. These shortwave television signals can be very powerful, and may replace local programs sporadically.

Some experts claim that the interference will become a real nuisance to television viewers in the United States, especially those in the fringe reception areas. Others believe that foreign reception will be a rare, freak occurrence. They all agree, however, that the problem is bound to get worse in the next few years.

Actually, very little is known about what will happen. During the last peak in the sunspot cycle, the difficulty did not arise because there were almost no foreign channels broadcasting on these susceptible frequencies. Today there are many all over the world, and more are expected to go into operation in the coming years.

Even now, as we come out of the low point in the sunspot cycle, U. S. stations are sometimes picked up in South American countries.

The reception of foreign channels in the United States may vary from a fairly clear picture, complete with sound, to all sorts of interference patterns and screeches or a combination of these effects. The reception, experts at the Federal Communications Commission pointed out, depends upon how active the sun is going to be in the coming cycle and what broadcast systems are used on the foreign station.

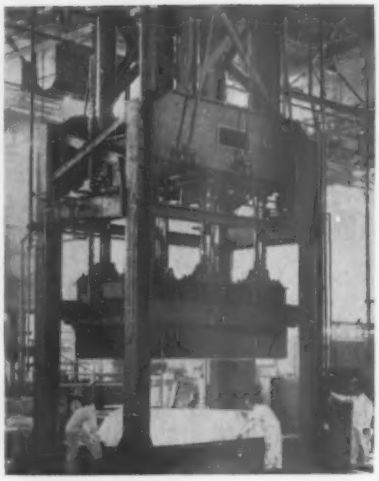
When the sun hurls out huge torrents of fiery hydrogen, a layer of the earth's atmosphere about 150 miles up, called the "F-2" layer, is affected. Ordinarily this roof of ionized air will reflect broadcast waves in the regular shortwave frequencies, from four to about 30 megacycles. But when the sun really acts up, the bounce can occur up to 50 or 60 megacycles, which is in the range of channels two and three.

When a local television station broadcasts, there are two possible ways that the signal can be picked up. The first is the beam that moves straight from the broadcast tower to the pickup antenna. The second is a wave that goes upward, then bounces back to earth from an atmospheric layer. This broadcast beam continues to be reflected back and forth between the earth and the layer, allowing reception all over the world when conditions are just right.

Reception of foreign television programs, when and if it comes, is expected to be primarily from South America, though there is a definite possibility that European stations will also come over.

Perhaps the greatest interference rate will be encountered on television sets in areas where reception is weak. The local signal they pick up is not as steady and is more easily affected by foreign programs.

Science News Letter, February 26, 1955



BOAT PRESS—Workmen prepare to remove a hull from this 700-ton press, believed to be the largest of its kind. It was designed for forming one-piece plastic hulls for outboard motor boats. This machine is one of five of its kind that has been installed in Goodyear Aircraft Corporation's plant.

MEDICINE

Pain Is Like Speedometer

➤ PAIN IS like the speedometer which shows how fast your car is moving. The pain tells the rate at which your body is being damaged.

This comparison was given by Dr. James D. Hardy of the Naval Air Development Center, Johnsville, Pa., at a meeting of the Philosophical Society of Washington, D. C. Dr. Hardy is research director of the Aviation Medical Acceleration Laboratory at the Center.

Unfortunately for doctors trying to diagnose damage to the body from the symptom of pain, this symptom does not tell how much nor how serious the damage is. Pain only tells the rate at which the damage is done.

The finding of pain as a speedometer for damage explains the common experience of having a cut hurt worse when the knife is dull than when it is sharp, Dr. Hardy said. The damage is being done more slowly though the cut may not be as deep.

Using the speedometer comparison further, Dr. Hardy pointed out that when you reach your destination the speedometer of your car reads zero. Similarly, when damage has been done to the body, there is no pain. The pain of the damage only comes while the damage is being inflicted. This explains why a severely wounded man does not necessarily feel pain.

Patients can die of cancer with little or no pain, Dr. Hardy declared. The reason cancer in its late stages is usually painful is because the cancer growth has grown big enough to press on other structures in the body and cut off their blood supply. As these other structures are being damaged in this way, pain is felt.

In some cases of severe wounds, pain is felt after the wounding. This is because neighboring pain fibers are being secondarily damaged and the pain is coming from them as they are damaged.

While Dr. Hardy has not studied all kinds of pain, he feels that the finding about pain telling the rate of damage holds true in all cases. If a person has a pain in his stomach, for example, it may be because acid is eating the lining of the stomach. When he takes a glass of milk, this removes the damaging agent and he feels no more.

Pain must be distinguished from other feelings such as fear, anxiety, hostility, sad ism and masochism, Dr. Hardy said. Cultural influences must also be excluded in studies of pain.

Science News Letter, February 26, 1955

An *ostrich egg* weighs about three pounds and the empty shell can hold the contents of 18 hen eggs.

One person in ten spends some part of his life in a *mental hospital.*

CHEMISTRY

Diamonds Manufactured

Diamonds have been produced for the first time by man by using immense heat and pressure. The synthetic stones are equal in quality to natural diamonds.

See Front Cover

➤ REAL DIAMONDS have been made artificially by a once-discredited process, extremely high pressure and heat.

Success in manufacturing diamond crystals so hard that they scratch other diamonds was demonstrated in Schenectady, N. Y., by research scientists of the General Electric Co., Drs. Francis P. Bundy, H. Tracy Hall, Herbert M. Strong and Robert Wentorf.

Combining enormous pressure, 800,000 pounds or 400 tons per square inch, with a reaction chamber which can be heated to more than 5,000 degrees Fahrenheit, the G.E. scientists have so mastered the conditions under which diamonds form that they have been able to produce these, the hardest crystals in nature, in more than one way, out of more than one material.

Diamonds have been made every time, in more than 100 runs. This success contradicts earlier researchers who believed, after a number of failures, that increase of heat and/or pressure would never yield the crystalline form of carbon.

But the new man-made crystals pass the same X-ray test that is used to assay natural diamonds. Their hardness is greater than that of any other material. Some of the new crystals have been burned to carbon dioxide, to prove that they are really crystalline carbon. They easily scratched sapphire, silicon carbide and boron carbide as well as natural diamonds.

Diamonds have been found in meteorites. These heavenly missiles are believed to be fragments of an ancient planet which exploded, perhaps about the time our earth was formed. Study of the way these naturally occurring diamond crystals are found always imbedded in iron meteorites, never in stony ones, led General Electric scientists to select the temperatures, pressures and surroundings that proved successful for production of diamonds.

Iron meteorites would have come from the center of the exploded planet, and would have been subjected to heat and pressure similar to conditions calculated to exist some 240 miles below the surface of the earth.

Greatest obstacle to making diamonds according to these theories was a press capable of producing very high pressures in a container which could be heated and held at the high temperature. Both are necessary for rearrangement of the carbon atoms into the diamond's crystalline lattice form.

Chief problem in development of such a press was creation of a material for the container which would keep its contents intact during the time the pressure acts. Both these problems have been solved by the diamond-makers. The clusters of very small diamonds they have made were crystallized in a few minutes. To make the largest so far produced, the melt was held under constant conditions at a high temperature for 16 hours.

Earlier attempts to make diamonds in the laboratory have usually started with the element carbon in the form of graphite. The French chemist, Henri Moissan, who created great excitement by his claim to have made diamonds in 1894, used carbon in solution in molten iron. Scientists at the General Electric laboratories start with carbonaceous compounds. They have produced crystals of various colors, such as are found in the jewels produced in nature. The man-made crystals are up to 1/16th inch in length. The size of this crystal in comparison with a diamond high-fidelity phonograph needle is shown on the cover of this week's SCIENCE NEWS LETTER.

Jewelers would not scorn some of the artificially produced diamonds. They would pronounce them genuine. However, laboratory-made diamonds are not expected to invade the jewelry market. Industrial diamonds, the so-called "black diamonds," offer a more useful outlet if the General Electric Company should wish to put its diamond-making technique on a production basis. Cutting with diamond-studded drills and polishing with diamond dust are technical processes always in need of the super-hard carbon crystals.

The first artificial diamonds were made "late last year." Discovery that diamonds actually were made came when the core of super-hard matter from the pressure chamber wore away the polishing wheel.

There is some doubt whether extreme heat must always be used with the high pressure to make diamonds. All previous experiments with high heat, although with less pressure, gave graphite instead of diamonds. Measurements of free energy changes in carbon had suggested that intense cold such as found in outer space might aid in bringing about the change from graphite to diamond.

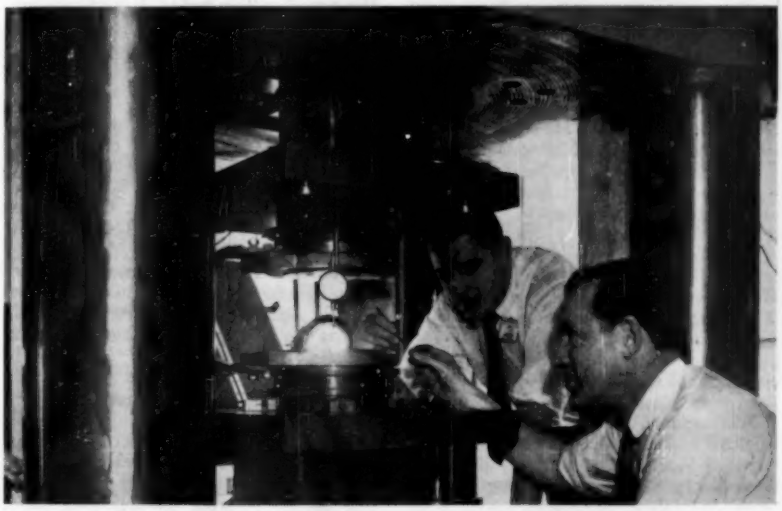
The giant press used in diamond production is capable of 1,500,000 pounds per square inch pressure, which is roughly equivalent to the squeeze computed for points 240 miles beneath the earth's surface. This equipment makes small diamonds in a matter of minutes.

The G.E. scientists bowed to Dr. Percy Bridgman of Harvard University whose discoveries in measuring extreme pressures were used in the diamond production.

The method of applying pressure in the giant press is similar to that pioneered by Dr. Bridgman. The further step taken by the General Electric team was in adding the heating device. The energy added to the syystem by heating turned the trick of shaking the carbon atoms out of their common arrangement into the special one which makes diamonds.

Dr. Bridgman's experiments were in the range where diamonds are possible.

Science News Letter, February 26, 1955



DIAMOND MAKERS—Dr. Herbert Strong (right) and J. E. Cheney watch General Electric's new 1000-ton press, capable of delivering pressures greater than 100,000 atmospheres, or 1,600,000 pounds per square inch, on an area of approximately one square inch.

GENERAL SCIENCE

Expect H-Bomb Tests

Four nations may test fusion bomb this year, despite recent warnings by scientists that unlimited detonation of such blasts may endanger populations.

➤ A SERIES of peaceful H-bomb explosions by the United States, Russia and a joint effort by England and Australia can be expected this year, barring a sudden flare-up of hostilities resulting in World War III.

Despite recent fears and warnings expressed by scientists in England, France and this country that unlimited and unchecked detonation of H-bombs is a real danger to the world, 1955 will by necessity witness new series of superbomb blasts.

Although the Atomic Energy Commission keeps a tight security on future plans for nuclear and thermonuclear tests, there is still much to be learned about H-bombs that theory and paperwork cannot tell American scientists. More is needed to be uncovered about such things as the phenomenon of fusion, transmutation of light elements and the conversion of mass into energy.

The much publicized H-bomb blast of March 1, 1954, and its lethal radioactive fall-out all but denuded our civil defense plans. To better understand the superweapon itself and ironically to help prepare a defense against it, the United States will have to test more H-bombs.

Any H-bomb tests by the United States will be conducted at the Pacific proving grounds. In July of last year, following the March furor, the United Nations Trusteeship Council gave its endorsement to the right of the United States to conduct further H-bomb tests in the Pacific if they were "in the interests of world peace."

Russia's H-bomb tests will probably be conducted somewhere in Siberia. Shortly after ex-premier Georgi Malenkov resigned, Foreign Minister V. M. Molotov rattled Russia's H-bomb might at the West and hinted that his country may have more superbombs in its arsenal than the United States has in its own armory.

This threatening message followed reports from Paris that Russia set off four unannounced nuclear explosions last fall, one of which is believed to have been an H-bomb. Japanese observers suggested that the tests took place on "Wrangel Island, inside the Arctic circle due west of American Point Barrow in Alaska."

Information from Australia indicates that England and Australia have agreed upon a series of atomic tests to be conducted in Australia in May, and including the first "made-in-England" hydrogen bomb. What the British will test has also been described as a new, streamlined device for triggering its H-bomb.

The joint British-Australian nuclear tests will be held at the new Australian atomic proving grounds now under development near the Great Victorian Desert in southwest Australia. The Aussies are said to be abandoning the old proving grounds at Emu Field claypan in central Australia for these tests, because of problems encountered in transporting equipment and men in that wild and rugged part of the continent.

The tests will be under the direction of Sir William George Peney, director of Britain's Atomic Weapons Research Establishment, and are believed to include plans for firing guided missiles carrying live atomic warheads.

The danger from fall-out to the continent is less than it would be on a Pacific atoll, Prof. Marcus L. E. Oliphant, director of the research school of physical sciences at the Australian National University, has observed. The weather conditions over the Australian continent are better understood.

The material pulverized by an H-bomb exploded over ordinary ground is considered by Australian experts as less dangerous debris than the dust kicked up by a thermonuclear explosion on a coral atoll such as at the U. S. testing grounds in the Pacific.

Science News Letter, February 26, 1955

MEDICINE

Cancer Susceptibles Have Poor Antibody Factories

➤ HAVING POOR or inefficient antibody factories in the body leads to susceptibility to cancer.

This is true at least for mice and susceptibility to certain kinds of cancer, it appears from an American Cancer Society report of research by Drs. Samuel Albert and Ralph M. Johnson at the Detroit Institute of Cancer Research. Their work is supported by the society.

Antibodies are disease fighting substances in the gamma globulin fraction of the blood. Specific antibodies are formed in response to invasion of a specific disease germ, such as polio.

If it turns out that deficient antibody production goes with cancer susceptibility in other animals, including humans, tests might be worked out to detect cancer susceptibility long before the disease developed, the American Cancer Society pointed out. The Society reported the following about the Albert-Johnson research:

Two distinct factors seemed to weaken mice's ability to ward off breast cancer with antibodies: 1. A lack of inherited immunity with which they were born; and 2. a virus which they acquired from their mothers in nursing or with which they were injected. Increasing age also seemed to depress the antibody response of all mice.

The rodents' capacity to produce antibodies was measured by injecting them with radioactive phosphorus and, with the aid of counters, determining how rapidly the phosphorus was taken up and used by lymph nodes, which make antibodies.

Healthy lymph nodes took up phosphorus rapidly; and these animals beat down cancer transplants successfully. Unhealthy nodes did not take up much phosphorus and the animals proved highly susceptible to cancer transplants.

Science News Letter, February 26, 1955

SCIENCE NEWS LETTER
VOL. 67 FEBRUARY 26, 1955 NO. 9

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1955, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees — Nominated by the American Association for the Advancement of Science: Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University; Paul B. Sears, Yale University. Nominated by the National Academy of Sciences: Homer W. Smith, New York University; Edward U. Condon, Berkeley, Calif.; Harlow Shapley, Harvard College Observatory. Nominated by the National Research Council: Duane Roller, Los Angeles, Calif.; Ross G. Harrison, Yale University; Leonard Carmichael, Smithsonian Institution. Nominated by the Journalistic Profession: Neil H. Swanson, Baltimore, Md.; O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal. Nominated by the Scripps Estate: Charles E. Scripps, Cincinnati, Ohio; Edward J. Meeman, Memphis Press-Scimitar; John T. O'Rourke, Washington Daily News.

Officers — President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff — Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Howard Simons, Edward Hausman. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. Interlingua Division in New York: Alexander Gode, Hugh E. Blair, 80 E. 11th St., GRamercy 3-5410.

MEDICINE

Smoking Affects Heart

Tests show that tobacco has a definite effect on heart muscle, even in normal persons. Symptoms of "tobacco heart" are chest pain, irregular beat, breathlessness and dizziness.

➤ SMOKING AFFECTS your heart, whether you are a normal person or one with heart disease.

Tests showing that smoking has a definite effect on the heart muscle itself, even in normal persons, were reported by Dr. Isidore E. Buff of Charleston, W. Va., in the *Journal of the American Medical Association* (Feb. 12).

In both normal persons and patients with disease of the heart's arteries, smoking a single regular cigarette was followed by significant increase in heart rate and blood pressure, Drs. Henry I. Russek, Burton L. Zohman and Virgil J. Dorset of the U. S. Public Health Service found in tests at the Public Health Service Hospital on Staten Island, N. Y. They also reported that smoking affects the heart muscle and nerves, rather than its arteries.

Dr. Buff used the ballistocardiograph in his tests of 400 normal men and women aged 20 to 40. This instrument measures the "kick" of the heart, something like the recoil of a gun, and gives an idea of the strength of the heart's contraction and the state of its muscle.

Among the 400 normal persons, abnormal changes were found after smoking in five percent of the 20- to 30-year-olds and in 15% of the 30- to 40-year-olds. The change with age is to be expected, Dr. Buff pointed out, because the older ones "are approaching the 'coronary age' and the effect of cigarette smoking over a long period of time is beginning to be noticeable."

Dr. Buff could not say how many of those normal persons showing abnormal response to cigarette smoking would develop coronary artery disease. He felt, however, that it is "highly desirable that these patients stop using tobacco in any form."

Dr. Russek and associates reported that "tobacco heart" is a real condition, not just an old-fashioned notion. It can be confused with coronary artery disease, such as angina pectoris, unless proper tests are made. Symptoms are dull, heavy pain in the heart region, irregular heart beat, palpitations, breathlessness on effort, dizziness and changes in both ballistocardiograms and electrocardiograms. In the patients they tested, symptoms disappeared when the patients stopped smoking. In these patients, "denicotinized" cigarettes caused markedly less abnormal heart responses.

The "denicotinized" cigarettes, however, caused the same disturbances in heart disease patients as regular cigarettes, Dr. Russek's studies showed.

The idea that whisky protects the heart during smoking is "purely an illusion," Dr. Russek and associates reported. Whisky has a slight effect on the circulation only and does not counteract the effect of tobacco on the heart.

Smoking, his group found, does not "present a direct danger" to the patient with coronary artery disease by constricting the heart's arteries. But it has other "undesirable" effects, from increased heart rate and blood pressure to "hacking and coughing, diminished vital capacity, cardiospasm and gastritis." They call it "unsound" to permit smoking in heart patients, since they are already below par in heart and lung efficiency and physical condition.

Heart disease patients, they advised, should strive for "peak physical fitness at a safe level of activity," just as athletes do and, like athletes, should not smoke because smoking reduces physical fitness for exertion.

Science News Letter, February 26, 1955

EDUCATION

100,000 Want College Yearly But Lack Funds

➤ APPROXIMATELY 100,000 qualified American high school seniors each year have a strong desire to go to college, but cannot afford it.

It is a lack of money and not motivation or academic qualifications that prevent these students from going on to higher education, Dr. Robert J. Havighurst, professor of education at the University of Chicago, told the American Council on Education's subcommittee to study a Federal scholarship program in Washington.

The sub-committee, made up of representatives from both public and private educational institutions and organizations, is now engaged in analyzing a group of surveys to find a means of helping a larger proportion of qualified students get to college.

Dr. Havighurst, reporting the motivation of high school seniors in wanting to go on with their education, said that about 300,000 graduates each year are in the top one-quarter of their classes, but never go to college. He placed these students in three categories:

1. About 100,000 boys and girls who have the necessary grades and a very strong desire to go to college, but not enough money.

2. Another 100,000 who also have the grades, and may or may not have the money, but who have only a weak motivation to continue their education after high school.

3. A third group numbering about 100,000 who, although they may have both the money and desire, are felt to be "unfitted" for college and in all probability would not be recommended by their high schools.

Science News Letter, February 26, 1955

TECHNOLOGY

Transistors Made By Automatic Machine

➤ A MACHINE that automatically makes transistors, tiny amplifiers replacing vacuum tubes for many uses, is being developed by Bell Telephone Laboratories.

In less than one minute, the device, known as Mr. Meticulous, carries out more than 15 steps in the production of experimental transistors. First it takes a tiny bar, almost as thin as a human hair, of semiconducting material such as germanium or silicon and examines it electrically.

If the minute sliver is acceptable, the machine attaches a fine gold wire to a critical point on the bar with an accuracy of one twenty-thousandth of an inch. Then it connects this wire to one of the four wires leading out of the transistor, flips the bar end over end, and repeats the entire operation with another wire on the opposite side. Finally, it makes electrical tests on the completed transistor.

Advantage of the device, developed by R. L. Wallace of Bell Laboratories, is that substandard transistors are rarely produced. The machine may some day be a pilot model for industrial machines for assembly line manufacture of transistors.

Science News Letter, February 26, 1955

MAKES TRANSISTORS—"Mr. Meticulous," a robot device for assembling tiny experimental transistors, goes through its paces for Bell Telephone Laboratories' scientist R. P. Riesz. Inset shows a completed transistor compared with the edge of a dime. The wire shown is almost as thin as a human hair.

PUBLIC SAFETY

H-Bomb Contamination

➤ AN H-BOMB such as that exploded on March 1, 1954, in the Pacific would contaminate 7,000 square miles with deadly radioactivity, the Atomic Energy Commission revealed in its first public report on fall-out effects.

Admiral Lewis L. Strauss, chairman of the AEC, said the fall-out from that March 1 burst covered an elongated cigar-shaped area extending approximately 220 statute miles down-wind and varying in width up to 40 miles. In addition, there was a contaminated area up-wind and cross-wind extending possibly 20 miles from the point of detonation.

Data from this and other tests permits estimates of casualties that would have been suffered within this contaminated area if it had been populated, the AEC said. These estimates assume:

1. That the people in the area would ignore even the most elementary precautions.
2. That they would not take shelter but would remain out of doors completely exposed for about 36 hours.
3. That, in consequence, they would receive the maximum exposure.

Therefore, the estimates made, were extreme estimates since they assume the worst possible conditions.

On the basis of data from this test and other information, the AEC estimated, following the March 1 test explosion, there was sufficient radioactivity in a down-wind belt about 140 miles in length and of varying width up to 20 miles to have seriously threatened the lives of nearly all persons in the area who took no protective measures.

Some distance farther from the point of detonation, at about 160 miles down-wind and along the axis of the ellipse, the amount of radioactivity would have seriously threatened the lives of about one-half of the persons in the area who took no protective measures.

Near the outer edge of the ellipse, or approximately 190 miles down-wind, it is estimated that the level of radioactivity would have been sufficient to have seriously threatened the lives of 5 to 10 percent of any persons who might have remained exposed out of doors for all of the first 36 hours.

Thus, about 7,000 square miles of territory down-wind from the point of burst was so contaminated that survival might have depended upon prompt evacuation of the area or upon taking shelter and other protective measures.

At a distance of 220 miles or more down-wind, it is unlikely that any deaths would have occurred from radioactivity even if persons there had remained exposed up to 48 hours and had taken no safety measures.

These estimates do not apply uniformly throughout the contaminated area inasmuch as the intensity of radioactivity within a region of heavy fallout will vary from point to point, due to such factors as air currents, rain, snow, and other atmospheric conditions.

Because of this and because most persons, if given sufficient warning, probably would evacuate the area or take shelter and other precautionary measures, the actual percentage of fatalities could reasonably be presumed to be considerably smaller than these extreme estimates, the AEC said.

Larger Area Threatened

➤ THE AREA threatened by radioactive fall-out from an H-bomb exploded near the ground is at least twice as wide as the cigar-shape described in the official Atomic Energy Commission report.

Atoms spewing their lethal radioactivity as far as 200 miles down-wind could mean death to persons living a path at least 40 and perhaps 60 miles wide. They would probably not rain down on everyone inside such an area. But they could.

The reason all persons living in this larger area could be showered with radioactive dust is that winds might scatter the debris considerably more than indicated in the first official AEC report on fall-out.

That is, if intensely radioactive particles are carried 150 miles down-wind, turbulent winds are very likely to spread them over an area considerably wider than 20 miles.

But predicting exactly where debris would fall out is beyond present knowledge of meteorologists. Many of them believe that it will never be possible to pinpoint the precise location of an air mass 24 hours from any given time.

Civil defense officials thus should plan for evacuation of inhabitants from an area considerably greater than the recent official estimate if persons are to escape contamination by fall-out.

This larger danger area results from turbulence in the atmosphere. Occurrence of turbulence, whether in the air or in water rushing from a faucet, is not predictable as far as is now known. What is predictable is the probability of its occurrence, which follows the same laws of chance as coin tossing or the throw of dice.

Science News Letter, February 26, 1955

GENERAL SCIENCE

Reports of STS Winners

➤ THE ORIGINAL research projects of 40 of America's top high school scientists helped them win a trip to Washington to compete for $11,000 in Westinghouse Science Scholarships.

Here is the last in a series describing the work of the Science Talent Search Winners:

Extracts Drugs

➤ ALKALOIDS, ORGANIC substances that occur naturally in plants and animals, have been very important in medicine, as for example: morphine, the most important alkaloid of opium; and quinine, the most important alkaloid of cinchona bark.

Hoping to learn more about alkaloids, 18-year-old Winston Stanley Marshall of Nashville, Tenn., has extracted 24 different alkaloids. The Isaac Litton High School senior produced the alkaloids from leaves, roots, seeds and insects in an old horse shed which he has converted into a home laboratory.

Among the alkaloids that the teen-age researcher has extracted are cantharidin from powdered blister beetles, caffeine from tea leaves, berberine and hydrastine from golden seal, sparteine from Scotch broom, and sanguinarine from the blood root plant.

Builds "Clever" Machine

➤ AGRIS JANIS Kalnajs, a 17-year-old senior at Newton High School, Newtonville, Mass., can boast of having an electronic player that almost never loses in the ancient game of wits, known as "nim."

To play "nim," the young scientist explained, one must have another player and some objects, such as matches. Each player is allowed to take a small number of the objects in turn. The person who has to pick up the last object is the loser.

Inspired by a discussion of the game at a meeting of his high school Mathematics Club, Agris decided to construct the electronic device as a player.

He stated that the machine "plays perfectly," and that "once it has the upper hand it never loses it during the game." Construction of the nim player, the teenager reported, is a normal departure from his hobby of building audio equipment.

He hopes to become an electrical engineer after graduation from the Massachusetts Institute of Technology.

Million-Volt Generator

➤ A HIGH school senior of South Bend, Ind., has constructed a machine that is capable of generating between 500,000 and 1,000,000 volts.

As part of his entry in this year's Science Talent Search, Robert Earl Fassnacht has constructed a Van de Graaff generator. Substituting waxed mahogany for plastic or glass in building the insulating column, Robert is also using a paper belt for his generator.

The young scientist stated that he is going to use the generator to study the effects of radiation on the heredity of plants and animals.

Science News Letter, February 26, 1955

PSYCHIATRY

Pills Clear Delusions

Patients with schizophrenia, old age brain changes, and alcoholic hallucinations showed "dramatic" improvement when treated with new drug.

➤ PILLS THAT bring "dramatic" improvement in some mentally sick patients, clearing hallucinations, delusions and split personality symptoms, were announced by Dr. Howard D. Fabing, neuro-psychiatrist of Cincinnati, in Science (Feb. 11).

The pills are a pipradal chemical tradenamed Frenquel by the manufacturer, The Wm. S. Merrell Co., also of Cincinnati.

Whether they will become a cure for certain forms of mental sickness was not stated in Dr. Fabing's report.

Patients with hallucinations from alcohol and from the serious mental disease, schizophrenia, and from old age brain changes were among those he treated. Results were inconsistent in the dosages he used, but good enough to encourage him in further study of the new drug.

Some of the patients had acute schizophrenia, others were in the chronic stage of this disease. Some had hallucinations because of hardening of the arteries.

The drug also blocks the "model" mental diseases produced by two other chemicals, lysergic acid diethylamide, known as LSD-25, and mescaline.

LSD has been used by psychiatrists recently to bring on a mental disease state in healthy persons in the hope of learning more about how to treat or prevent real mental sickness. The effects of LSD, of course, are not lasting. Dr. Fabing gave it to two healthy male graduate students in psychology. One of them described his feelings while under the influence of LSD as follows:

"The prevailing feeling was that there was a gulf between me and the rest of the environment. It seemed that it would be impossible for me to communicate with those across this gulf because I could not establish any common points of reference. Within my own realm on my side of the abyss it was impossible to achieve any order. Attention was continually waning and there were no fixed reference points for thought to focus upon. Within this state on my side of the abyss I felt perfectly calm and entirely indifferent. Also within this state there were hallucinations and a sense of timelessness, all unusual, none of which had any real emotional tone to them."

Then Frenquel was given daily for one week followed by a second dose of LSD. After that dose, the student reported "the effects were markedly different. The one objective feeling which stood out was that of great calm and inner peace. There was some slight defect of attention and I didn't feel sharp mentally but I have experienced this same sort of feeling when a hard day's work has tired me out. I felt that I had the situation under control and that I was not dissociated at any time. There were no hallucinations. I felt that I could have gone through my normal routine that Saturday morning although I would have preferred that my work that morning be of a passive sort."

Further tests with Frenquel on six other healthy persons, three male and three female, also showed its ability, in large enough doses, to block the LSD effects.

Science News Letter, February 26, 1955

GENERAL SCIENCE

Group Seeks to Lift Language Barriers

➤ A GROUP of leading business men and bankers of Georgia has formed a corporation for the purpose of helping to remove the language barriers which hamper international communication and understanding. It is called the League to Lift Language Barriers, Inc.

It will operate chiefly by encouraging the study and teaching of Interlingua, the new scientific international language, and the practical application of Interlingua to the solution of problems of international communication.

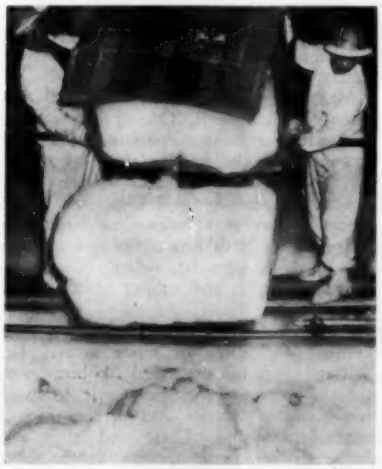
In slightly different words: "Su functiones principal essera incoragiar le studio e le inseniamento de Interlingua, le nove scientific lingua international, e le application practic de Interlingua al solution de problemas de communication international."

The petition of incorporation was presented by Abit Nix, Sidney O. Smith, M. Monroe Kimbrel, Darrell M. Johnson, and John T. McNeill, a group which includes several former governors of Rotary International in the Georgia district. The petition was granted by Judge C. J. Perryman of Thomson, McDuffie County, Georgia. Although the present leaders of the group are all Rotarians, its field of activity will not be limited to the Rotary movement.

The new organization grew out of the efforts of Ralph C. Lee of Thomson who had previously helped to form several local Committees to Reduce Language Barriers within the Georgia Rotary organization. Several school superintendents of Georgia have indicated to Mr. Lee their interest in introducing the study of Interlingua into the public schools.

The new corporation will carry on its work with the cooperation of the Interlingua Division of Science Service, 80 East 11th St., New York 3, N. Y., which now regularly supplies 11 medical journals and three other scientific publications with Interlingua translations.

Science News Letter, February 26, 1955



GLASS CLOUDS—A fibrous glass filter is being prepared to filter radioactive particles from the exhaust gases at the Hanford Atomic Products Operation. This bed of the fibers, seven feet deep and 56 feet long, is said to be more efficient and cheaper to operate than sand filters used in earlier designs.

ANTHROPOLOGY

Science, Art Flourished In Mayan Agriculture

➤ FAVORABLE AGRICULTURAL conditions freed the ancient Maya from problems of subsistence and permitted scientific and artistic accomplishments.

Ancient Mayan agriculture could have supported a population density greater than that of modern Mexico, Dr. Joseph Hester Jr., and Dr. George W. Brainerd of the department of anthropology at the University of California at Los Angeles have concluded.

Mayan civilization was centered in the hot, tropical lowlands of the Yucatan peninsula. A shifting, "bush-fallowing" type of agriculture apparently produced enough corn, the chief staple food of the Maya, to support indefinitely a population of from 30 to 50 persons per square mile. This is greater than the population density of modern Mexico.

The soil and annual precipitation of the region are well suited to this crop. Even with primitive techniques, including dooryard gardening, the region could have supported a population of more than 4,500,000, in their findings. Although archaeological evidence indicates there were many large Mayan "cities" in the area, there is no evidence that population ever reached this figure.

Science News Letter, February 26, 1955

SURGERY

Shoe Lace Machine Braids Nylon Arteries

➤ SUCCESS WITH the first use of a crimped, "no kink" artery of tightly woven nylon to restore a damaged femoral artery in a middle aged man was announced by Dr. W. Sterling Edwards of the Medical College of Alabama, Birmingham, Ala., at the meeting of the Society of University Surgeons in Houston, Tex.

An old machine formerly used for braiding shoe laces was used to braid the nylon to exact specifications. This is said to have been the critical point in development of the new kind of substitute arteries.

Dr. Edwards' patient, faced with amputation of a leg because of blocked circulation, recovered with good circulation in his foot one month after the nylon substitute artery was given him.

Fabric tubes have been made and used in the last two years in human artery replacement, but these were handmade tubes. A need exists for a prefabricated tube of various sizes so that surgeons in all communities, and especially in wartime, can have artery replacements readily available in large numbers. Surgeons at the Medical College of Alabama, with the cooperation and research assistance of The Chemstrand Corporation, producers of Chemstrand nylon and Acrilan acrylic fiber, have been working to develop an ideal prefabricated tube to bridge permanently arterial defects.

Science News Letter, February 26, 1955

NUTRITION

Thymus Chemical Seen as Vitamin Ingredient

➤ AN IMPORTANT ingredient of previously unknown vitamins has been discovered in an "intensely" yellow chemical from the thymus gland. The mystery of this gland's function may be solved and its hormone isolated as a result.

The chemical is probably a flavone, akin to Nature's yellow dyestuff. Its discovery was announced by Dr. Albert Szent-Gyorgyi, Hungarian-born Nobel Prize winner now at the Institute for Muscle Research, Woods Hole, Mass., at a New York Academy of Sciences conference in New York.

The newly discovered chemical is present in "amazingly big" quantities in thymus glands. The thymus of calves is known as the neck sweetbread. In children this gland in the chest is quite large, but in grown-ups it usually has shrunk to very small size.

Dr. Szent-Gyorgyi's yellow chemical may be part of a vitamin that keeps very small blood vessels healthy.

This chemical and other flavones react with metals. The flavone-metal combination may, Dr. Szent-Gyorgyi said, "hold the key to better understanding of the working of the machinery of life."

A related chemical, hesperidin, from citrus fruit when combined with vitamin C seems to help strengthen the very small blood vessels called capillaries.

Living matter, Dr. Szent-Gyorgyi thinks, is a mechanism which in preciseness "surpasses by several dimensions the finest Swiss watch." When little blood vessels become fragile and leak blood, the living mechanism is out of order. The idea of putting this mechanism right with a decoction of orange peel seems to Dr. Szent-Gyorgyi like "repairing a Swiss watch by driving a nail into it.

"This absurdity can be resolved by a philosophical outlook," he continued. "In my eyes there is but one living matter on this globe. However different their shapes, colors and complexities, all living systems are but leaves of the same old tree of life and are based on the same common basic principles.

"There is no real difference between cabbages and kings. So if the king's capillaries do not work well, possibly because one of their constituents is missing, and you can put these capillaries right again by an extract of the cabbage, then this means that you have put one precision mechanism right by taking out an identical screw from another, similar precision mechanism, and the good fit only shows the close relation, the essential identity of the two systems."

Science News Letter, February 26, 1955

BIOLOGY

Hopes Parakeets Will Tell Secrets of Cancer

➤ MOST PEOPLE who have parakeets hope their pet talking birds will not learn to tell any secrets. But not Dr. Hans G. Schlumberger of Ohio State University in Columbus, Ohio. He is trying to get some parakeets to tell him some of the secrets of cancer.

Many cancers occur with unusual frequency in these birds. One of the commonest and most awesome tumors is that of the pituitary, the small gland that lies at the base of the brain and controls other hormone-producing glands of the body. These tumors may become so large that they push the birds' eyes out of their sockets. The birds become fat, flabby, blind, apathetic, impotent, and subject to convulsive seizures.

Shortly before death they often lose their appetite and seem to waste away. Dr. Schlumberger has examined 106 birds with these tumors and has been able to grow pieces of the tumors beneath the skin of normal parakeets. These birds then also become obese, as do those with the spontaneous tumors.

The parakeet's way of life, including its sex life, is now under study by Dr. Schlumberger because he thinks an abnormal functioning or excessive demand on the sex, adrenal, throid or other endocrine glands may make the pituitary grow larger than normal.

His studies are supported by the American Cancer Society.

Science News Letter, February 26, 1955

IN SCIEN

ANTHROPOLOGY

Blond, Dark Children "Evolution in Operation"

➤ "EVOLUTION CAUGHT in the act of operation," is how Dr. Joseph Birdsell, University of California at Los Angeles anthropologist, describes the strikingly blond, dark-skinned children among the aborigines of the Australian desert.

These unusual children may be examples of a mutation that has occurred repeatedly in this region during thousands of years, Dr. Birdsell believes. He has just returned from a two-year study of genetic factors among Australian peoples.

Like most people who have survived for thousands of years in extremely hot areas, these people have very dark skins and brown eyes. Their eyebrows are black. Their blond hair darkens some as they grow older, turning a mousy color by adulthood, but it never becomes the black color characteristic of peoples of other hot regions.

Dr. Birdsell suggests that such blond hair may be a major pigment change resulting from a mutation.

"It is a unique characteristic which is not manifested in any other dark-skinned people," he reported, "although there is some suggestion of it in Melanesia."

The characteristic survived through the years, Dr. Birdsell speculates, because it is a manifestation of biochemical factors, resulting from the mutation, conducive to desert survival. The blond hair itself is probably not directly related to desert survival.

Science News Letter, February 26, 1955

TECHNOLOGY

Man-Made "Ice-Fog" Checked by New Device

➤ MAN-MADE ICE-FOG that "socks in" Arctic airfields can now be licked by a new device developed by the Armour Research Foundation, Chicago.

The fog is caused by internal combustion engines that spurt huge plumes of ice-fog from their exhausts when temperatures drop below minus 24 degrees Fahrenheit.

Tests by the U. S. Army Corps of Engineers in Alaska showed that when one of these ice-fog eliminators is installed in an engine, the plume is barely visible. The device removes the moisture from the exhaust by cooling it, mixing in cold air, then reheating the fumes before discharge.

Very little moisture is needed in extremely cold weather to saturate the atmosphere. In some cases, even vapor breathed out by humans is enough to cause ice-fog.

Reduced visibility is believed to be caused by small particles of ice in the air.

Science News Letter, February 26, 1955

CE FIELDS

ELECTRONICS

Tiny Radio Transmitter Fits Into 20mm Shell

➤ A RADIO transmitter about the size of the first joint of your ring finger has been developed by the Navy. Not only is it smaller than a wrist radio, but it is shock proof too, and works even after being shot out of a cannon.

The purpose of the tiny unit, called a spin sonde, is to trace the rotation of 20 millimeter projectiles as they speed toward their targets. The device, which fits inside the warhead, is powered by a mercury battery with a life of 200 hours and uses transistors instead of radio tubes. It is believed to be the smallest ever developed.

As the transmitter rotates along with the projectile in flight, it sends out radio messages that are picked up and recorded by an oscilloscope on the ground. The device was built to withstand shocks 30,000 times the force of gravity. It can be used over and over again since ordinarily it can withstand the shock of hitting the test target.

The transmitter was designed by Roy J. Smollett of the technical evaluation department of the Naval Ordnance Laboratory in Washington.

Science News Letter, February 26, 1955

BIOLOGY

Chinchilla Transfusion Needs No Blood Typing

➤ NO SCURRYING around to find a donor of the right blood type when a chinchilla gets sick or bleeds seriously enough to need a transfusion. Chinchillas, like many other rodents, all have essentially the same blood type.

This reassuring news for those who keep pet chinchillas or breed them for their fur comes from research by Mrs. Ruth L. Bass of Altadena, Calif., graduate student at the University of Southern California.

All the 750,000 chinchillas in this country are so closely related that only small individual differences in their blood can be detected with sensitive laboratory tests.

Ninety percent of the total chinchilla population represent the offspring of the four male and seven female animals brought to Inglewood, Calif., in 1923 by the late Mathias Chapman, an American mining engineer, from the 17,000-foot altitudes of the Andes mountains in Chile.

"The chinchilla in this country is a highly inbred form," Mrs. Bass said. "Whether the chinchilla in his native habitat is actually a single type of animal with a common heredity or the result of interbreeding of closely related animals is still open to question among scientists and breeders."

A soft-furred, gray rodent, the chinchilla has been highly inbred to make its fur more desirable. Recently breeders began to wonder if the animals had different blood types, and if such information could be used in breeding. The SC research was undertaken although rodents are noted for their lack of blood groups.

Science News Letter, February 26, 1955

BOTANY

Variegated Thistle Causes Cattle Deaths

➤ THE VARIEGATED thistle has been put on the public enemy list of poisonous plants in the United States for the first time.

Known also as the milk or bull thistle in many areas, the thistle has caused the death of several cattle in California, Drs. John W. Kendrick, John Tucker and S. Anderson Peoples of the School of Veterinary Medicine at the University of California, Davis, Calif., reported to the *Journal of the American Veterinary Medical Association* (Jan.).

A study of the cattle deaths indicated that nitrate poisoning, brought on by eating the variegated thistle, was the cause. The scientists stated that prior to the California outbreak, the thistle was not considered among the poisonous plants of this country. In some areas of the United States, they said, the mature thistle is used as a winter feed.

Symptoms of the nitrate poisoning, the California scientists stated, were a blue discoloration of the mucous membrane, a rapid pulse, accelerated and labored breathing, weak and staggering walk and diarrhea. Other animals from the affected herd were maintained on hay for two days and then moved to another pasture. No further deaths occurred, they reported.

Science News Letter, February 26, 1955

MEDICINE

High Heels Held Cause Of Sickness in Women

➤ HIGH HEELS that throw the body and its functioning out of balance were blamed for many of the gynecologic disorders of women of 30 or older.

The charge was made by Dr. Dudley J. Morton of New York in a report to the *Journal of the American Medical Women's Association* (Feb.).

Foot disorders, he pointed out, afflict women six to 10 times as often as men.

"Wide observations indicate that the popularity of the very high 'spike' heel has created the idea among women that the 2½ or 2-inch heel is a low heel," Dr. Morton said. "As a result, the constant use of the latter throughout women's daily activities has been a greater factor in causing their foot troubles than has the shorter and less enforced periods of weight-bearing associated with 'spike' heels."

Science News Letter, February 26, 1955

AGRICULTURE

California Turfgrass Worth $650,000,000

➤ THE VALUE of California's lawns and other turfgrass installations "ain't hay." In fact, more than $650,000,000 is invested in such plantings and the annual upkeep is estimated to be $250,000,000 annually.

Marston H. Kimball, agricultural extension specialist in ornamental horticulture on the Los Angeles campus of the University of California, has compiled figures on a turfgrass survey of Los Angeles County by James Beutel of the University's Agricultural Extension Service and Fred Roewekamp of the Los Angeles Department of Recreation and Parks.

They found that Los Angeles County's turfgrass acreage of 63,000 is a $262,000,000 investment and costs $90,000,000 annually to maintain. More than 50,000 of these acres are in residential and apartment house lawns, which number 1,260,600 in Los Angeles County.

By interpolating the Los Angeles County figures on a population basis, there are 160,000 acres of such grass.

Science News Letter, February 26, 1955

MEDICINE

Atomic X-Rays Readied For War or Peace Use

➤ AN ATOMIC X-ray machine for war or peacetime use has been developed by the Army.

The machine uses radioactive thulium and radio-sensitive photo paper. Neither electricity, water nor dark room is needed to develop the picture, which shows immediately.

The whole machine with lead-lined case to protect personnel is contained in a 48-pound unit that packs nicely on a medical aidman's back.

For Army use, this means aidmen can carry it up to the battlefield and take X-ray pictures of the wounded where they lie. If necessary the aidman can look at the picture to detect broken bones that need splinting before the man is moved. Or he can have the X-ray pictures waiting for the wounded man when he reaches the battalion aid station where he sees the first doctor.

For civilian use, the new radio-X-ray machine can be carried in ambulances going to accidents or in the doctor's car. While it does not show detail as well as the conventional X-ray machines, it gives a clear enough picture for field use. When in production it is expected to cost $200.

The radioactive thulium heart of the unit is expected to last about one year. Then it can be sent back to the atomic pile for rejuvenation for another one-year stretch of duty.

The unit was developed at the Armed Services Medical Research Laboratory at Fort Knox, Ky.

Science News Letter, February 26, 1955

ASTRONOMY

Jupiter Still Prominent

Mars also visible low in the west in the constellation Aries, the ram. It is faint, however, because it is more than 176,000,000 miles from the earth.

By JAMES STOKLEY

➤ ALTHOUGH CONSTELLATIONS suggestive of spring are now visible in the evening skies of March, the brilliant array of star groups which made the midwinter heavens so bright is still with us, now toward the southwest. And among these orbs Jupiter still shines high in the south as the most prominent star or planet to be seen.

All these are on the accompanying maps which show the skies' appearance at about 10 p.m., your own kind of standard time, on March 1, an hour earlier at the middle of the month and two hours earlier at the end.

The planet Jupiter is seen in Gemini, the twins, just below the stars Castor and Pollux.

Lower down is Procyon, in Canis Minor, the lesser dog, and still lower the greater dog, Canis Major. In this figure we find Sirius, the dog-star, brightest of all the stars in the nighttime sky.

Orion's Belt

Toward the southwest Orion, the warrior, is easily recognized because of the three stars in a row that form his belt and the two first-magnitude stars associated with it. One is Betelgeuse, above the belt, which marks one of Orion's shoulders, while the other, Rigel, is below and located in one of his knees.

To the right of Orion is Taurus, the bull, with the ruddy star Aldebaran, also of the first magnitude. A little higher and farther to the right — shown on the map of the northern skies — is Capella, in Auriga, the charioteer.

Another planet now visible is Mars, which is low in the west in Aries, the ram. It is now rather faint because it has receded to a distance of more than 176,000,000 miles, far beyond the close approach of less than 40,000,000 miles that it made during the past summer.

An hour or so before midnight Saturn rises, equal to a bright star of the first magnitude. It is in the constellation of Libra, the scales, which is next to Virgo in the zodiac, the belt of 12 constellations through which the planets, like the sun and the moon, seem to move.

Constellations more typical of spring than of winter can be found toward the east. High in the southeast, for example, is Leo, the lion, with the star Regulus.

This is at the end of the handle of a subgroup called the sickle since it has the shape of that useful agricultural implement. As a lion, the blade of the sickle forms the head, while Regulus is in his shoulder. The second-magnitude star Denebola, farther east, is supposedly in the animal's tail.

Below Denebola is Virgo, the virgin, and at the bottom part of this group, close to the horizon, is Spica. This is another star of the first magnitude, although it is greatly dimmed in this position on account of its low altitude.

In the northeast can be seen the great dipper, a part of Ursa Major, the great bear. The two stars in the bowl of the dipper away from the handle are well known as the pointers, since a line drawn through them toward the north leads to Polaris, the pole star, which stands almost directly over the north pole of the earth.

The handle of the dipper, too, can be used as a guide. Following the line of its curve one comes to Arcturus, in the group of Bootes, the bear-driver.

A further continuation of this line goes on to Spica.

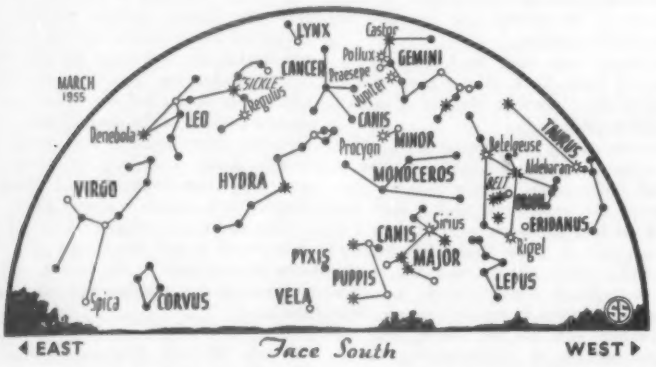
Jupiter, which is visible as soon as it gets dark, sets about four a.m. at the beginning of March, and shortly afterwards an even more brilliant planet rises in the east. This is Venus, now in the constellation of Capricornus. It is so bright that it can be followed well into the dawn, long after all the other stars and planets have vanished.

With Jupiter standing among the bright stars of Gemini, its movement can easily be followed. At the beginning of the year, for example, it was practically in line with Castor and Pollux but now it is well to the west of that line. In recent months it has been moving westerly, but on March 16 this movement ceases.

Jupiter Moves East

After that it will move toward the east. By the end of May once again it will be in line with Castor and Pollux. During the summer months it will be so nearly in the sun's direction as to make it invisible.

By the beginning of autumn it will reappear as a morning star, rising before sunrise, and on Nov. 8 will pass at a distance less than the moon's apparent diameter to the north of Regulas. But on Dec. 18 this eastward motion will halt, and Jupiter will seem to turn and move to the west once more.



☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

CLEAN CAR?

Wipe it off every nice day with a $2 KozaK Auto Dry Wash Cloth and you'll NEVER have to hose it. KOZAK will even DRY wash a nice car that is so dirty you can hardly tell the color of the paint. Been doing it for 29 years now. For people whose cars are ALWAYS clean, this $2 investment will return you fifty in car wash savings. And has been so Guaranteed to 10 million buyers since 1926. *Mail coupon to:*

THE ORIGINAL

KOZAK Auto Dry Wash

22 S. Lyon St. Batavia, N. Y.

© KOZAK, 22 S. Lyon St., Batavia, N. Y.
Please send me POSTPAID:

Super $3 KozaKs Last 4 Times Longer ☐ 1 for $3

Reg. $2 KozaKs Millions Use Them ☐ 1 for $2

☐ Special Introductory Offer
2 Reg. KozaKs Plus 1 Super (Value $7)
All for $5

☐ Cash ☐ Check Enclosed

Celestial Time Table for March

Mar.	EST	
1	7:40 a.m.	Moon in first quarter.
4	5:04 a.m.	Moon passes Jupiter.
8	10:41 a.m.	Full moon.
9	1:23 a.m.	Algol (variable star in Perseus) at minimum brightness.
10	7:00 p.m.	Mercury farthest west of sun.
11	10:13 p.m.	Algol at minimum.
13	5:07 p.m.	Moon passes Saturn.
14	4:00 p.m.	Moon farthest, distance 251,300 miles.
	7:02 p.m.	Algol at minimum.
16	11:36 a.m.	Moon in last quarter.
20	9:08 p.m.	Moon passes Venus.
21	4:36 a.m.	Sun over equator, spring commences.
23	10:42 p.m.	New moon.
26	11:00 a.m.	Moon nearest, distance 226,400 miles.
27	5:34 a.m.	Moon passes Mars.
29	3:08 a.m.	Algol at minimum.
30	3:10 p.m.	Moon in first quarter.
31	10:42 a.m.	Moon passes Jupiter.
	11:57 p.m.	Algol at minimum.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, February 26, 1955

In ancient times men watched the movements of the planets among the stars. When they saw this sort of thing happening regularly they found it hard to explain, since they supposed that the earth was at the center of the universe and that the sun, moon, planets and stars all moved around us as a center.

By the second century, A.D., there was developed the Ptolemaic theory, named after Claudius Ptolemy, the Alexandrian astronomer who proposed it. This had each planet moving in a little circle, called an epicycle, the center of which moved in a large circle around the earth.

Thus, the general movement of Jupiter, for example, would be to the east, but periodically its motion in the epicycle would take it westward, as it has been doing in recent months. As more accurate observations were made, it was found that even this did not suffice, so more and more epicycles had to be added, increasing the complexity of the celestial machinery.

Our modern concept, proposed by Copernicus in 1543, has the sun at the center and the earth revolving around it along with the other planets. The planets nearer the sun go faster both in miles per hour and in the time required for a complete revolution. Earth's speed is 18.5 miles per second while that of Jupiter is only 8.1, which takes it once around its orbit in a little less than 12 of our years.

With our higher speed, the earth catches up to Jupiter every 400 days and as we overtake it that planet seems to go backward in the sky.

The effect is exactly the same that one often notices on a passenger train when passing a freight train on the next track. To the faster-moving passengers, it seems as if the freight is going backwards, although both are actually going in the same direction.

That is what has been happening with Jupiter in recent months, but now as we draw well away, its direct motion becomes apparent again.

When *alfalfa*, a livestock feed, is cut, made into dry meal and stored sometimes as much as 75% of the carotene, a vitamin A precursor, combines with oxygen and disappears.

The Right Way to Play

CHESS

A Chess Manual for All, from Beginner to Club Player, by Chess Pundit D. BRINE PRITCHARD, with Introduction and Annotations by International Chess Master IMRE KONIG.

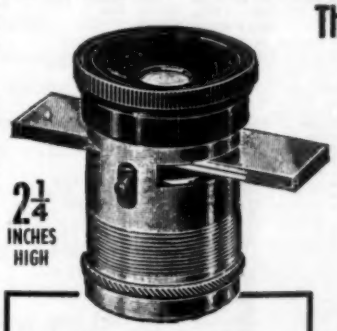
A different method of teaching chess. Discards "archaic" instruction. Explains the game briefly, then plunges directly into play, from which emerges winning theory. "Learn-by-doing". Tells HOW to think about chess, not WHAT to think. Games from the Masters with detailed explanations "WHY" by Chess Master Imre Konig. Explains the Opening, the Middle game, the End game, and Traps. PROFUSELY ILLUSTRATED. Order now: THE RIGHT WAY TO PLAY CHESS $2.50 Postfree • 257 Pages

5-Day Money-Back Guarantee

EMERSON BOOKS, Inc., Dept. 354-K
251 West 19 Street, New York 11

NEW 50-X-MINIVEX MICROSCOPE REVEALS NATURE'S HIDDEN WONDERS

This ▶● tiny speck changes into:



ENLARGES AREA UP TO 2,500 TIMES

The MINIVEX costs only 1.98—yet it gives you a "million dollars" worth of thrills. This miracle of German production reveals a New World of hidden wonders—a world of infinite variety and beauty. NOT A TOY—yet it's more thrilling than any toy—and far more educational for young & old. Get yours today on our money-back guarantee.

IMPORTED FROM WEST GERMANY 1.98

NOW—thanks to German efficiency and high precision workmanship—you can own this high power microscope at an unheard of price. The 50-X-MINIVEX is pocket size . . . only 2¼ inches high . . . but you get terrific power! Imagine it—two thousand five hundred times area magnification! So powerful that a tiny gnat looks like a pre-historic monster!

Educational . . . Fun for Young and Old!

The 50-X-MINIVEX provides endless fun and thrills for young and old. Reveals nature's hidden wonders . . . the wondrous formations in a drop of water . . . the God-given beauty of leaves, flowers, cells, tissue, inorganic matter. Ideal for study of textiles, blood specimens, foods, minute plant life. Also for home and lab study of botany, zoology, nature, chemistry.

Optically-Ground Lenses! Super Viewing!

The powerful lenses made by German optics craftsmen give you super-sharp viewing! Durable metal construction and push-button operation. Get several now on a 5-day money back guarantee. Send check, cash or m.o. for immediate free delivery. COD's plus charges. RUSH order now! Remember: you must be delighted or money back quick!

INTERNATIONAL BINOCULAR CO.
352 Fourth Ave., Dept. 96-B-12 New York 10, New York

Low Price Paper Cover Books

Circle Numbers You Want
Tear Out and Mail

- **Large volume and paper bindings mean BIG VALUE at LOW COST. Contain up to 225 color plates.**
- **Each title carefully selected. Authoritative, pocket size books. Well written, beautifully illustrated, nothing left out. In cloth bindings many sell for several times as much.**
- **Produced by leading publishers, including Pocket Books, Perma-books, Simon & Schuster, New American Library, Avon, Penguin, Barnes & Noble, etc.**
- **All prices postpaid and insured. On 10 or more books, deduct 5¢ per book.**

Use this ad as an order blank. Circle numbers, tear out and mail, with payment, name and address.

SCIENCE

Thousands of Science Projects. 46p. B821 25¢
New Handbook of Heavens. Illustr. B920 55¢
Stars, Full Color Guide. Zim & Baker. C279 $1.05
Discover the Stars. Illustr. 136p. C226 80¢
Plan for 100 Power Telescope. 24p. B835 20¢
Birth & Death of the Sun. Gamow. 220p. B932 55¢
Biography of the Earth. Gamow. B915 40¢
Universe & Dr. Einstein. Barnett. B929 40¢
Principles of Relativity. 11 papers. B135 $1.55
Einstein's Theory of Relativity. B136 $2.00
Physics Without Mathematics. 200p. B467 $1.35
College Physics. Bennett. 208p. B421 $1.10
Slide Rule Practical Use. 49p. B456 $1.10
3000 Curiosities of Light & Color. B137 $1.95
Know & Predict the Weather. Fisher. B937 40¢
Science of Flight. Sutton. 208p. C132 40¢
First Year College Chemistry. B405 $1.60
Chemical Elements Chart 38x50in. F804 $2.00
Organic Chemistry. Degering. 420p. B406 $1.85
The Chemical Industry. (Pelican) C114 55¢
Metals & How They Serve Man. 240p. C121 70¢
Mineralogy Handbook. (Eckert.) 24p. B826 55¢
Minerals in Industry. Jones. 224p. C122 40¢
Semi-Precious Stones. Illustr. Smith. B988 $1.00
Principles of Geology. Field. 211p. B413 $1.35
Principles of Bacteriology. Bryan. B403 $1.95
Beyond the Microscope. Smith. 152p. C134 55¢
Hunting with a Microscope. 132p. C229 80¢
General Biology. Alexander. 224p. B404 $1.35
Dictionary of Biology. B993 55¢
General Botany. Fuller. 196p. B433 $1.10
General Zoology. Alexander. 290p. $1.35
Ant World. Morley. B997 55¢
Fundamentals of Physiology. 336p. B521 $1.30
Meaning of Evolution. Simpson. B927 40¢
Dictionary of Science. 240p. B990 55¢
Understanding Science. Conant. 144p. B940 40¢
Science & Modern World. Whitehead. B916 40¢
Limitations of Science. Sullivan. B942 40¢
Science & Hypothesis. Poincare. 244p. B128 $1.30
Science & Method. Poincare. 288p. B127 $1.30
Greek Science. 600 B.C. to Ptolemy. C107 70¢

NATURE AND PETS

Birds, Full Color Guide. 112 illus. C276 $1.05
How to Know the Birds. Peterson. B918 40¢
Watching Birds. Fisher. 188p. B998 55¢
American Mamals. Sanderson. 176p. B925 40¢
Reptiles, Color Guide. 212 illus. C281 $1.05
Insects, Color Guide. 225 illus. C278 $1.05
Trees, Color Guide. 130 illus. C280 $1.05
Flowers, Color Guide. 224 illus. C277 $1.05
How to Know Wild Flowers. 144p. B919 40¢
Stars, Color Guide. 150 illus. C279 $1.05
Nature for All. 136p. B514 80¢
Guide to Nature Hobbies (Hammond). B806 $3.15
How to Care for Live Animal Pets. B833 20¢
Care and Breeding of Budgies. 128p. B121 70¢
Your Dog-Puppy to Old Age. 128p. C219 65¢
Care of Cats. Wilson. 128p. B110 65¢
Tropical Fish. 128p. C228 80¢

SELF HELP

What to Do About Your Invention. C223 65¢
Inventor & His World. Hatfield. 256p. C118 40¢
Everyday Law in Plain Language. 24p. B153 25¢
Law Guide for All. Ruben. 85p. B511 80¢
How to Drive & Stay Alive. B706 $2.05
Work, Study, Travel Abroad. C806 50¢
How to Afford a College Education. B707 $2.15
Guide to Free Educational Materials. B824 $5.75
Guide to Free Slides & Filmstrips. B822 $5.25
Guide to Free Films. B823 $6.25
Economics in Everyday Life. Williams. C115 55¢
All About Money. 24p. B156 25¢
Consumers Guide to Better Buying. C901 40¢
Consumers Research Ann. Buying Guide. B856 $3.50
Directory of 4,387 Magazines. B287 $2.10
Your Way to Popularity & Pers. Power. B908 30¢
Guide to Good Looks. 160p. B127 15¢
How to Relax. 32p. B152 25¢
Don't Underestimate Woman Power. B211 30¢
Why Some Women Stay Single. B200 30¢
Women and Their Money. (Pub. Aff.) B190 30¢
Intelligent Parents Manual. 320p. C156 70¢
Enjoy Your Child. Ages 2 to 5. B188 30¢
Your Child Starts to School. B197 30¢
Understand Your Child, 6 to 12. B189 30¢
How to Discipline Your Children. B193 30¢
Youth Participates, 12 to 18. B181 30¢
Keeping Up with Teen Agers. B184 30¢
Children Who Never Had a Chance. B224 30¢
Grow Up and Live. Chesser. 170p. C127 70¢
Successful Living. Chesser 170p. C126 55¢
Challenge of Medical Research. B180 30¢
The Races of Mankind. (Pub. Aff.) B206 30¢
The Negro in America. (Pub. Aff.) B207 30¢
Human Rights. Baldwin. (Pub. Aff.) B209 30¢
What About Communism? (Pub. Aff.) B219 30¢

PSYCHOLOGY AND PSYCHIATRY

Dictionary of Psychology. 320p. B992 70¢
Uses and Abuses of Psychology. B982 75¢
General Psychology. 273p. B424 $1.35
Mental Health. 28p. B194 30¢
Your Body & Your Mind. 190p. B909 30¢
Psychiatry Today. Stafford-Clark. B981 70¢
Freud's Psychoanalysis. B958 55¢
Freud's Psychopathology. B928 40¢
Animals & Men. Katz. 190p. C112 55¢
Personality of Man. Tyrrell. 296p. C103 70¢
Personality of Animals. Fox. 156p. C120 55¢

HEALTH

Handy Home Medical Adviser. Flabbien. B967 40¢
Headaches. Cause & Relief. 16p. C401 15¢
Skin Allergies. Hirschfeld. 24p. C375 30¢
Allergies in Children. 24p. B819 30¢
You & Your Heart. Marvin, etc. 192p. B910 30¢
All About Colds. Tobey. 24p. B165 25¢
How to Save Your Teeth. Yahraes. 28p. B240 30¢
Polio Can Be Conquered. Blakeslee. B241 30¢
How to Live with Heart Trouble. 32p. B249 30¢
High Blood Pressure. Crosby. 32p. B245 30¢
Cancer. Facing the Facts. 28p. B231 30¢
Arthritis—The Miracle Drugs. B244 30¢
Tuberculosis. Blakeslee. 28p. B242 30¢
Diabetes. Conklin. 28p. B238 30¢
Epilepsy. Yahraes. 28p. B232 30¢
Alcoholism. Blakeslee. 28p. B234 30¢
Atlas of Human Anatomy. 86p. B470 $2.10
Human Physiology. Walker. 170p. C158 55¢
Genetics. Peiffer. 32p. B243 30¢
Physical Basis of Personality. 170p. C120 55¢
Science of Seeing. Mann & Pirie. B995 70¢
Live Long and Like It. Crampton. 28p. B239 30¢
Baby & Child Care. 220p. B347 30¢
Healthy Babies. Kenyon & Russel. B905 30¢

SEX AND MARRIAGE

Story of Human Birth. Hilleboe. 32p. B817 30¢
How to Tell Your Child About Sex. B192 30¢
Having a Baby. Carson. 32p. B201 30¢
Planing Your Family. Yahraes. 32p. B187 30¢
Adopting a Baby. Carson. 32p. B198 30¢
Physiology of Sex. Walker. 158p. C100 55¢
Psychology of Sex. Schwarz. 286p. C141 70¢

NEW SCIENCE ADVENTURE CATALOG

Make your life more fun, more profitable, more interesting. Packed with over 1,200 items; science materials, hobbies, travel aids, life and vocational guidance, aptitude tests, wall-charts, unusual maps, consumer and health guides, languages, slides, records, nature specimens, low priced paperback books on everything from art to zoology, etc., etc. Catalog 10¢.

World of Adventure, Dept. 150, Ann Arbor, Mich.

Sex Habits of American Women. B340 40¢
Analysis of Kinsey Reports on Sex. B946 55¢
So You Think It's Love. Eckert. 32p. B196 30¢
Building Your Marriage. Duvall. 28p. B183 30¢
Making a Successful Marriage. 124p. B943 30¢
Fertility in Marriage. 166p. B948 30¢

SELF-EDUCATION

Effective English in Speech. 24p. B157 25¢
Speech & Voice Training. 270p. B489 $1.85
Common Errors in English. 344p. B540 $1.30
How to Sell What You Write. C224 65¢
Journalism. Mott. 444p. B415 $1.85
Grammar, Rhetoric & Composition. B507 $1.30
English Grammar. Kurne. 308p. B461 $1.35
Short History of English Literature. C140 40¢
100 Famous Novels—Plot Outlines. B515 $1.40
100 Famous Plays—Plot Outlines. B536 $1.30
Who Wrote That? Quiz Book. C155 40¢
German. Greenfield. 240p. B434 $1.35
Say It in German. (Dover.) 128p. B101 55¢
Say It in Spanish. (Dover.) 124p. B105 55¢
Say It in French. (Dover.) 128p. B100 55¢
French. Dumont. 277p. B435 $1.35
Say It in Italian. (Dover.) 128p. B103 55¢
Say It in Russian. (Dover.) 124p. B104 55¢
Say It in Hebrew. (Dover.) 122p. B102 55¢
English for Spanish Speakers. B106 55¢
Touch Typewriting for All. 128p. B529 $1.05
Shorthand for All. 112p. B525 $1.05
Bookkeeping Made Easy. 310p. B585 $1.30
Engineering Drawing. 432p. B486 $2.10
Writing Better Examinations. 32p. B436 60¢
Mathematics for Everyday Use. 363p. B512 $1.30
College Algebra. Moore. 230p. B438 $1.10
Trigonometry. 314p. B445 $1.35
Analytic Geometry. Oakley. 246p. B468 $1.35
Calculus. Oakley. 221p. B448 $1.35
Facts from Figures. Moroney. 472p. C130 90¢
Money & Banking. Spero. 238p. B469 $1.35
Principles of Economics. 359p. B408 $1.60
Income & Economic Progress. 32p. B212 30¢
International Relations. 330p. B470 $1.60
Archaeology—Digging Up the Past. C111 55¢
General Anthropology. 338p. B420 $1.60
Heredity, Race & Society. B931 40¢
The Greeks. Kitto. C105 55¢
Greek Historical Thought. B930 40¢
The Romans. Barrow. C136 55¢
U. S. Constitution. Nevins. 32p. B166 25¢
Indians of the Americas. Collier. B917 40¢
Aztecs of Mexico. Vaillant. 334p. C149 90¢
Farmer's Annual Almanac. (Ford.) B907 $1.10
Ships. Illus. Pye. 64p. C151 70¢
U. S. Fighting Planes. Illus. 64p. B829 $1.05
Jet Airplanes. Illus. 32p. B161 25¢

EARNING A LIVING

How to Get and Keep a Job. B508 55¢
How to Travel and Get Paid for It. B700 $1.05
Where to Find Opportunity Today. B722 $1.05
Guide to Civil Service Jobs. 104p. B830 $1.05
Working Wives & Mothers. 32p. B203 30¢
Women and Their Money. 32p. B190 30¢
Earning Money by Telephoning. B721 $1.05
Making a Living in the Country. B703 $1.10
How to Earn an Income While Retired. B717 40¢
Getting Ready to Retire. 24p. B202 30¢
Retire Young & Start Living. 32p. B716 40¢
How to Retire to the Country. 38p. B718 40¢
Where to Retire on a Small Income. B704 $1.05

TRAVEL

Vacation on a Shoestring. B702 $1.05
Complete US Road Maps (Rand-McN.). F120 $1.60
Duncan Hines Vacation Guide. 380p. B807 $1.60
Duncan Hines. Recommended Hotels. B808 $1.60
Hotel-Motel Guide 12 x 16 in. C810 $5.15
Motor Camping. 96p. C208 65¢
Duncan Hines Good Eating Places. B809 $1.60
Scenic Inns of America. 150p. B811 $1.60
How to Know & Enjoy New York. Maas. B939 40¢
New York City. Travel Guide. B849 $1.10
New England. Travel Guide. B846 $1.10
Washington, D. C. Travel Guide. B847 $1.10
Florida. Travel Guide. B708 $2.05
Chicago. Travel Guide. B850 $1.10
California. Travel Guide. B851 $1.10
Travel Routes Around the World. B701 $1.05
Foreign Lands at Stay-at-Home Prices. B712 40¢
Bargain Paradises of the World. B705 $1.55
Work, Study, Travel Abroad. C806 50¢
Freighter Travel Guide Book. B805 $2.10
Travel & Get Paid for It. B700 $1.05
How to Get a Job on a Ship. B711 40¢

SPORTS, HUNTING AND FISHING

How to Improve Your Basketball. B682 55¢
How to Improve Your Bowling. B683 55¢
Bowling Handbook, 3 Booklets. B800 30¢
Tumbling & Gymnastics Handbook. B801 35¢
How to Improve Your Baseball. B681 55¢
Baseball Handbook, 7 Booklets. B802 60¢
How to Improve Your Softball. B685 55¢
How to Improve Your Golf. B684 55¢
How to Improve Your Tennis. B686 55¢
Badminton Handbook, 4 Booklets. B803 45¢
How to Improve Your Archery. B680 55¢
Archery Handbook, 4 Booklets. B804 45¢
How to Sail. Carter. 128p. C209 80¢
Fisherman's Handbook. 384p. B843 $1.10
Sportsman's Digest of Fishing. B546 $1.05
Sportsman's Digest of Hunting. B547 $1.05
Hikers' Guide. Solomon. 96p. C207 65¢
American Combat Judo. 128p. C212 65¢

HOBBIES

How to Pick Your Hobby. 64p. C221 65¢
Creative Handicrafts. 128p. C217 65¢
Drawing for Fun. 92p. C216 65¢
How to Paint Your Own Pictures. 222p. C125 55¢
Photography for Fun. Strong & Garber. C220 65¢
Camera Handbook for Travelers. 96p. B723 $1.05
Aquariums. Evans. 128p. B107 70¢
Beekeeping. Clark. 222p. C157 70¢
How to Juggle. 24p. B832 20¢
How to Throw Knives. 32p. B831 20¢

GAMES AND PARTIES

The Party Book. 24p. B155 25¢
Life of the Party. 128p. C206 65¢
Book of Games. 32p. B162 25¢
Magic Tricks. Jonson. 128p. B117 70¢
Card Tricks. Jonson. 128p. B109 70¢
125 Card Tricks. 64p. B834 35¢
Mathemagic. Heath. 128p. B134 $1.05
American Square Dances. 128p. C201 65¢
Folk Dances for All. Herman. 100p. B503 $1.05
How to Dance the Rhumba. B133 $1.05
Contract Bridge. Culbertson. 120p. B902 30¢
How to Win at Gin Rummy & Canasta. B334. 30¢
First Book of Chess. 128p. B541 $1.30
Chess in an Hour. Marshall. 60p. C203 65¢

HOMEMAKING, FOOD AND DRINK

Short Cut Cook Book. 28p. B543 $1.05
Once-in-a-While Cook Book. 28p. B158 25¢
Home Made Gifts. 96p. B163 25¢
Home Decorating Guide. Terhune. 24p. B164 25¢
How to Know American Antiques. 192p. B924 40¢
Sew It Yourself. Rene Crucil. 24p. C405 15¢
Child's Book of Sewing. Chapman. 66p. B151 25¢
Rugmaking. Brinley. 128p. B120 65¢
Pottery & Ceramics. Rosenthal. B998 90¢
Pottery & Glass. Holowood. C152 70¢

HOME CRAFTSMAN

Home Repairs & Improvements. Stieri. B548 $1.55
Working with Tools. 128p. C218 65¢
How to Remodel Basement & Attic. C252 30¢
Electric Wiring & Appliance Fixing. C254 30¢
How to Paint, Inside & Out. (Pop. Mech.) C250 30¢
How to Lay Linoleum & Tile. (Pop. Mech.) C251 30¢

MUSIC AND SONG BOOKS

Music for Everybody. Spaeth. 128p. C222 65¢
What to Listen for in Music. 160p. B934 40¢
Dictionary of Music. 318p. C109 70¢
History of Jazz. Harris. 256p. C101 55¢
Harmonica Course & 200 Songs. 64p. C301 25¢
5-Minute Chromatic Harmonica Course. C309 25¢
5-Minute Violin Course. C313 25¢
5-Minute Cornet & Trumpet Course. C322 25¢
5-Minute Bugle Course. 18p. C306 25¢
5-Minute Baton Twirling Course. 18p. C307 25¢
5-Minute Ukulele Course. 24p. C316 25¢
5-Minute Tenor Bango Course. 18p. C318 25¢
5-Minute Guitar Course. 16p. C314 25¢
5-Minute Hawaiian Guitar Course. C321 25¢
5-Minute Concertina Course. 16p. C312 25¢

Mail your orders to:

WORLD OF ADVENTURE
Dept. 150, Ann Arbor, Mich.

MEDICINE

Nature's Yellow Dye

➤ NATURE'S YELLOW dyestuff and related chemicals, found in such different things as oranges, tree barks and tobacco, promise to help fight certain artery troubles and other ailments of man.

The chemicals are now called bioflavonoids. One of them, discovered in 1936 by Dr. Alfred Szent-Gyorgyi, Nobel prize winner, has been named vitamin P or Citrin.

At a New York Academy of Medicine conference in New York honoring Hungarian-born Dr. Szent-Gyorgyi, scientists told of new uses for such chemicals.

The successful use of one of them in the artery trouble, coronary thrombosis, was reported by Dr. Charles E. Brambel of Mercy Hospital, Baltimore. Patients with this and other artery trouble are often given anti-coagulant chemicals to keep their blood from forming dangerous clots in vital blood vessels. But in about one in 20 patients the anti-clotting treatment causes bleeding from tiny blood vessels called capillaries. Black and blue spots appear on arms and legs without any bump or bruise to cause them. There may be bleeding from the nose and mouth, or from the rectum or there may be blood in the urine.

To check this without stopping the anti-clotting treatment, Dr. Brambel has been giving one of the bioflavonoids, hesperidin, with vitamin C. In tests, one group of patients was given the hesperidin-vitamin C treatment after black and blue spots had developed. These cleared in two or three days, much faster than usual in such cases, and it was not necessary to stop the anti-clotting chemicals.

In another group of 200 patients, the two chemicals were given at the start of the anti-clotting treatment. None developed any bleeding complications of any kind, though these would have been expected in at least 10. The hesperidin-vitamin C were given in capsules of a combination called Hesper-C by the manufacturer, National Drug Company of Philadelphia.

Just how the substances act on capillaries is not fully understood. Dr. Gustav J. Martin of National Drug suggested that the true mechanism is probably a series of interrelated actions.

Dr. Richard E. Lee of Cornell University Medical School said he thinks that blood leakage into tissue occurs not in the capillaries, but in the venules, the next larger branch of the circulatory tree.

Some of the bioflavonoids act like female hormones in influencing the breeding cycles of animals, Dr. Edmund Cheng of Iowa Agricultural Experiment Station, Ames, Iowa, reported. Among these are genistein, diadzen and biochanin A, which are found in clover and alfalfa hays.

Science News Letter, February 26, 1955

Science Leaps Barriers of Language With Journal, Scientia International

Monthly Edition of *Science News Letter* in Interlingua

Scientia International carries the news of science to the non-English speaking areas of the world. Appearing monthly, it can be read by anyone anywhere. Terse, packed with information, it contains careful selections from the English-language weekly edition.

Subscribe to Scientia International for friends abroad. A gift card will be sent in your name.

Subscription to Scientia International is only $2 a year. For airmail transmission, add the actual cost of 12 half-ounce airmailings: $1.20 airmail postage for Latin America, $1.80 for Europe and $3.00 for the Near and Far East and Africa, etc.

Help the free international flow of scientific information by subscribing to Scientia International for friends and acquaintances in non-English speaking countries abroad. In other countries there is no journal like Science News Letter. But now you can supply them with one in a language which is not their native tongue but which they can read with utter ease.

Take out a subscription to Scientia International for yourself and keep up with the progress of this periodical appearing in Interlingua.

Send as gift in my name SCIENTIA INTERNATIONAL to the following by ☐ Regular Mail ☐ Air Mail

Name _____ Name _____ **Send gift card in name of:**

Address _____ Address _____ Donor's Name _____

City _____ City _____ Address _____

Country _____ Country _____ City, Zone, State _____

☐ Enter my subscription also. ☐ Bill me. $ _____ enclosed. ($2 for each subscription, plus airmail postage if ordered.)

Mail to SCIENCE NEWS LETTER, 1719 N Street, N.W., Washington 6, D. C. 2-26-5

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AAR RESEARCH ACTIVITIES 1954—*Association of American Railroads*, 40 p., illus., paper, free upon request direct to publisher, AAR, Transportation Building, Washington 6, D. C.

ANTHROPOLOGICAL PAPERS NUMBERS 43-48—M. W. Stirling, Director—*Govt. Printing Office*, Bureau of American Ethnology Bulletin 157, 415 p., illus., paper, $2.75. Reports of recent research.

THE BOOK OF AMERICAN INDIANS—Ralph B. Raphael—*Arco*, 144 p., illus., $2.00. For children, but also of interest to their elders.

THE BOTANY OF COOK'S VOYAGES: And Its Unexpected Significance in Relation to Anthropology, Biogeography and History—Elmer Drew Merrill—*Chronica Botanica*, 219 p., illus., $4.75. Discussion of what plant species were or were not present in a given Pacific Island in the decade following 1769 when the first extensive collections were made in Tahiti.

CUMULATIVE INDEX TO THE FIRST FIFTEEN SEMIANNUAL REPORTS TO CONGRESS JANUARY 1947—DECEMBER 1953—U. S. Atomic Energy Commission—*Govt. Printing Office*, 118 p., paper, 35 cents.

DICTIONARY OF AMERICAN PROVERBS — David Kin, Ed., with preface by Mark Van Doren—*Philosophical Library*, 290 p., $6.00. "Proverbs must be single sentences that hit and run."

EDUCATORS GUIDE TO FREE TAPES, SCRIPTS AND TRANSCRIPTIONS—Walter A. Wittich and Gertie L. Hanson, Eds. — *Educators Progress Service*, 144 p., paper, $4.75.

THE EVOLUTION OF AN INSECT SOCIETY — Derek Wragge Morley—*Scribner's*, 215 p., illus., $3.95. An English entomologist describes life in a commune of five separate but friendly nests of wood ants. Then he traces the origins of some of their behavior.

FINANCING HOSPITAL CARE FOR NONWAGE AND LOW-INCOME GROUPS: Volume 3 of Financing Hospital Care in the United States — Harry Becker, Ed.—*McGraw-Hill*, 110 p., illus., $2.50. Considering the problem of how the "medically indigent" can obtain the care they need.

FORTIETH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS 1954—Jerome C. Hunsaker, Chairman—*Govt. Printing Office*, 74 p., paper, 55 cents. This is the administrative report without technical reports. It tells of the struggle to keep ahead in the race of aeronautic research in spite of decreasing appropriations.

NEW TECHNIQUES FOR EFFICIENT TEACHING

This book includes game-like, automatic, self-checking, and puzzle-like devices and methods. Presented to all pupils in order to give more variety and thus relieve the three great boredoms of the school room—Reading, Writing and Listening. Presented to all teachers as tools for multiplying their power to teach and for dividing their time spent in correcting papers.

Price.....$1.75

Wooden Display Boxes 6½ x 1 x 8½ . . $1.25
8½ x 1 x 12½ . . $1.75

ECKERT MINERAL RESEARCH

Prospectors' Supplies

110 E. MAIN ST. FLORENCE, COLORADO

HANDY MAN'S PLUMBING AND HEATING GUIDE —Maurice H. Reid and Byron B. Courtney—*Arco*, 144 p., illus., $2.00. To assist the home owner in making simple repairs and adjustments and to understand those done for him.

LABORATORY ANALYSIS OF SOILS: Grain Size and Liquid Limit — A. M. Wintermyer and others—*Highway Research Board*, Bulletin 95, 37 p., illus., paper, 60 cents.

A NEW PICTOGRAPHIC AUTOBIOGRAPHY OF SITTING BULL—Alexis A. Praus—*Smithsonian*, 4 p., 7 plates, paper, 35 cents. A set of self-portraits drawn and colored by the famous Indian warrior for a little girl whose parents were kind to him while he was a prisoner.

OBITUARY NOTICES OF FELLOWS OF THE ROYAL SOCIETY — *The Royal Society*, 264 p., illus., 30 s. Brief biographies and portraits of deceased leaders of science in England.

ONE HUNDRED MATHEMATICAL CURIOSITIES—William R. Ransom—*J. Weston Walch*, 212 p., illus., paper, $3.00. A collection of amusing jokes, puzzles, games and oddities.

RAILROAD TRANSPORTATION: A Statistical Record 1921-1953—*Association of American Railroads*, 43 p., paper, free upon request direct to publisher, AAR, Transportation Building, Washington 6, D. C. Statistics assembled from reports of the Interstate Commerce Commission.

SEVENTEENTH SEMIANNUAL REPORT OF THE ATOMIC ENERGY COMMISSION—Lewis L. Strauss, Chairman—*Govt. Printing Office*, 138 p., illus., paper, 45 cents.

SOUTH COL: A Personal Story of the Ascent of Everest — Wilfrid Noyce — *William Sloane*, 300 p., illus., $5.00. This poetically written book with its lovely illustrations lets you know what it is like to reach the heights.

THE TRUE BOOK OF ANIMAL BABIES — Illa Podendorf—*Childrens Press*, 47 p., illus., $2.00. A book of colored pictures and easy text telling how baby animals need and receive care.

THE TRUE BOOK OF DINOSAURS — Mary Lou Clark—*Childrens Press*, 47 p., illus., $2.00. Introducing young children to the strange beasts of long, long ago.

THE TRUE BOOK OF WEEDS AND WILD FLOWERS—Illa Podendorf—*Childrens Press*, 47 p., illus., $2.00. A beautiful book for little children.

VERY MUCH ALIVE: The Story of a Paraplegic —Terry McAdam—*Houghton Mifflin*, 146 p., $3.00. Telling how men can learn to live with a handicap that results in paralysis from the waist down (or from the neck down), to work and even have fun.

WHEN THE MIGRANT FAMILIES COME AGAIN: A Guide for Better Community Living—Interdepartmental Committee on Children and Youth —*Govt. Printing Office*, 27 p., illus., paper, 15 cents. The coming of migrant laborers for a brief stay during the harvest presents the community with varied problems of health, education, and social opportunity. Here are suggestions for handling them.

WORLD OUTSIDE MY DOOR—Olive Bown Goin —*Macmillan*, 184 p., illus., $3.50. For the reader interested in animals and how they live and the ways biologists have of finding out about them. The author's door is at the edge of a woodland in Gainesville, Fla.

BOTANY

NATURE RAMBLINGS

Spring Flowers Now

➤ THIS IS the time of year when one is apt to take a pessimistic view of the poet's rhetorical query, "If winter comes, can spring be far behind?" It seems, indeed, very far behind as we approach the middle of winter's last half.

Yet you can have spring flowers now. They will brighten up your home, conjure you out of your late-February blues and convince you that perhaps the poet was right after all.

All you have to do is to go out and cut a few sprigs from one of the spring-flowering trees or shrubs. Lilac, cherry, apple, or perhaps, best of all, forsythia or golden bells will usually give good results. Select a branch that has rather large buds, for these are most likely to conceal the coming flowers.

Put your sprigs in a vessel of water in a warm place and be sure to see that the water does not dry out or become foul or sour. In not too long a time, about a week or two, you should see the twigs respond to the artificial spring temperature you have created with an offering of foliage and bloom.

Actually, this is what the florists have done in essence when they force the woody branches now offered in the early spring market. There are other tricks, too, that the ambitious layman can do if he wishes to get his spring flowers ahead of time. The simplest is merely to pre-immerse the

AT YOUR FINGERTIPS —

More than 800 Element Facts

The Elemental Slyd-Rul now completely up to date. Symbol, weight, density, number, valences, color, M & BP in °C for 98 elements plus recent name changes. In tough-check cardboard stock. $1. postpaid. Student rate: 12 or more, 75c ea.

The Slyd-Rul Co., Canaan, N. Y.

PHILOSOPHICAL LIBRARY BOOKS

☐ **THE GYROSCOPE APPLIED** *by K. I. T. Richardson.* A book, *The Gyroscope and Its Applications,* was published in 1946 when secrecy restrictions prevented reference to many interesting achievements and possibilities. Since then considerable technical advances have been made and the secrecy restrictions have been relaxed to some extent, although they still apply in many instances. The present book therefore, based on that published in 1946, has been almost entirely rewritten describing much that is new but at the same time incorporating most of the information given in the first version, although this is presented in a different manner and in some cases from a different viewpoint. $15.00

☐ **THE ELEMENTS OF CHROMATOGRAPHY** *by T. I. Williams.* Although less than a decade has passed since the appearance of *An Introduction to Chromatography,* so much new work has been published that a completely new book, rather than a revised edition of the old one, seemed called for. In particular, paper partition chromatography has developed enormously since 1946, and ion-exchange chromatography, which proved so spectacularly successful in Manhattan Project, had then scarcely been described at all. Both these methods have received due attention here. $4.75

☐ **FLIGHT HANDBOOK.** The fundamental theory of aerodynamics is simply explained, and the design principles of each class of aircraft, from balloons to missiles, are lucidly described. Engineering principles in piston engines, gas turbines, ramjets, pulse-jets and rockets are discussed, and the theory of aerial navigation is also covered.

On the practical side, there is a vast amount of information on modern aircraft and engine construction, on auxiliaries, controls and instruments, furnishings and fittings, armament, landing gear and similar matters. Types of aircraft dealt with in detail include balloons, airships, gliders, sailplanes, piston-engined and jet fixed-wing machines, helicopters and other rotorcraft, and even guided missiles. *More than 200 photographs and drawings.* $6.00

☐ **GLASS REINFORCED PLASTICS** *edited by Phillip Morgan.* Glass reinforced plastics is a many-sided subject, and a proper study of it involves organic chemistry, design, moulding processes and the major applications. Each of these branches might, in itself, fill a small book, and the present volume is therefore an attempt to gather together the essential facts for the general reader, yet explained in sufficient detail for the specialist. $10.00

☐ **DEVELOPMENT OF THE GUIDED MISSILE** *by Kenneth W. Catland.* This edition has been completely revised and greatly enlarged, a number of useful features having been added. New chapters deal with problems of propulsion, research into rocket techniques and requirements, and post-war work on guided bombs. Of particular importance is the detailed survey of Russian potentialities for long-range rocket development. An appendix reveals some details of the telemetering equipment used in British missiles, and another appendix shows photographs, to scale, of over 40 notable rockets from various countries. The table of characteristics which was an important feature of the first edition has also been enlarged, and now provides data on 140 powered rockets from eight countries. *Illustrated.* $4.75

☐ **ASPECTS OF DEEP SEA BIOLOGY** *by N. B. Marshall.* After tracing the growth of deep sea biology, one of Mr. Marshall's aims has been to build up, chapter by chapter, an integrated account of oceanic life. This life is seen to be disposed in patterns—patterns related to the physical structure of the ocean and to the interplay of living activities. *Illustrated.* $10.00

MAIL THIS COUPON TODAY

PHILOSOPHICAL LIBRARY, Publishers
15 East 40th St., Desk 35, New York 16, N. Y.

Send books checked. To expedite shipment I enclose remittance $.....

NAME.....

ADDRESS.....

• RADIO

Saturday, March 5, 1955, 5:00-5:15 P.M. EST

"Adventures in Science," with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Kalman Jacob Mann, director general of Hadassah's Medical Organization in Israel, will discuss "Medicine in Israel."

twigs in a pan of rather warm water for a few minutes. For best results, the temperature should be just above that which is comfortable to your hand. This extra stimulus will speed up blossoming by several days.

Some florists get good results from hardy, woody branches by pounding the bottom of the stem to a pulp. This maceration opens up the vessels carrying water to the buds, speeding up the blossoming process. It will not work with soft, pulpy sprigs.

Another of the tricks involves a little more in the way of materials and labor. This is to expose the sprigs in a closely covered vessel to the fumes of ammonia, chloroform or several other chemicals. If this is tried, the twigs should be left in the fumes for at least half an hour.

These treatments will work with almost any free-flowering, woody plant that blossoms in the spring. Earlier in the winter they would not have worked because many buds have to go through a somewhat obscure physiological process to which we have given the convenient but not wholly clarifying name of "ripening."

This process goes on slowly during the winter and by the time the corner of the season is turned and spring, though still distant is approaching, the buds are ready to respond to the proper stimuli of water and warmth, even if they are applied a little prematurely.

Science News Letter, February 26, 1955

Questions

BIOLOGY—How are parakeets used to study cancer? p. 136.

☐ ☐ ☐

CHEMISTRY—How much pressure and how high a temperature was used to produce the first man-made diamonds? p. 131.

☐ ☐ ☐

ELECTRONICS—The sunspot cycle will change the properties of which atmospheric layer, perhaps allowing foreign TV reception? p. 130.

☐ ☐ ☐

MEDICINE—What effect does smoking have on the heart? p. 133.

☐ ☐ ☐

PUBLIC SAFETY—About how large an area would an H-bomb contaminate? p. 134.

☐ ☐ ☐

Photographs: Cover, and pp. 131, 135, General Electric Company; p. 130, Goodyear Aircraft Corp.; p. 133, Bell Telephone Laboratories; p. 144, Eastman Chemical Products.

SAVE on Palley OPTICAL BARGAINS

Palley HY-POWER
100-200-300 POWER
3-TURRET
MICROSCOPE
NOW Only 89.95
Compares to Instruments selling up to $75.00

An UNSURPASSED VALUE! Has fine ground and polished achromatic lenses. Precision ALL-METAL construction. Triple revolving objective lens turret enabling selection of 100X – 200X – 300X. Has right or left hand rack and pinion adjustment for smooth, precise movement. 90° inclination. Adjustable plano sub-stage mirror. Complete in sturdy, dovetailed hardwood case. Your Satisfaction GUARANTEED!

NEW
IMPORTED 1500X
RESEARCH
MICROSCOPE
$189.50

Compares to Instruments selling up to $230

For BACTERIOLOGY – HISTOLOGY – PATHOLOGY BIOLOGY – BOTANY – ETC.

A top quality, professional instrument. Has a triple revolving turret with three precision ground & polished achromatic objective lenses – 10X, 40X and 100X oil immersion. Plus three Huygenian eyepieces of 5X, 10X and 15X giving up to 1500 power magnification. Has a sturdy, lifetime metal body which inclines through 90° for micro-photography. Rack and pinion control. Fine focusing adjustment. Large, 120mm x 113mm square stage which holds slides up to 3"x2". Sub-stage has an Abbe two-lens divisable condenser with Iris diaphragm and rack and pinion motion. Complete in fitted professional type carrying case with lock and key.

Satisfaction GUARANTEED or Your Money Refunded!

NEW ARMY SURPLUS
178mm–f:2.5
EASTMAN CAMERA
LENS

A $200 SURPLUS VALUE

Originally designed for use on K-21 and K-24 Aerial Cameras. A genuine EASTMAN AERO EKTAR 178mm lens. Has speeds from f:2.5 to f:16. Focal length is 7". This amazing lens is NEW, in original cans. Guaranteed perfect condition. Ideal for Color or Black & White. Exceptionally good for night work or in poor light conditions. Comes with 2 filters; 1 Polarized (for haze) and 1 yellow, plus a filter adapter, a lens heater for high altitudes and a lens dust cap. Can be adapted to 35mm cameras as well as others as a Telephoto lens (see adapter and mount listings below) . . .

ONLY 69.50

SPEED GRAPHIC ADAPTERS for above lens – Includes Lens Board, Extension Tube and Bed Support.
2¼" X 3¼" 21.75 3¼" X 4¼" 18.75 4"X5" 14.95

35mm ADAPTERS and MOUNTS for above lens Complete – no other parts to buy. Focus from 8ft to infinity – marked on the mount.
LEICA – CONTAX S&D – EXACTA 8.95
CONTAX 2A . . . $109.50 – HASSALBAD . . . $139.50

Pay by M.O. or check. ½ deposit with C.O.D.'s. Prices F.O.B. Los Angeles.

PALLEY SUPPLY CO.
2263 E. VERNON AVE., DEPT 14B
LOS ANGELES 58, CALIF.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 767. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

CIGARETTE LIGHTER, no thicker than a package of matches and weighing slightly over one ounce, is fully automatic. Described as flood-proof, the flint and spark wheel are removed by finger tip touch before filling, eliminating the possibility of saturating the working parts.

Science News Letter, February 26, 1955

NON-SHATTERING VIALS with flip-up hinged caps are made of polyethylene plastic for safety and convenience. Capable of being opened or closed with one hand, these waterproof, and acid- or alkali-resistant lightweight containers are designed to hold drugs or other small, easy-to-lose contents.

Science News Letter, February 26, 1955

ACCOUNTING MACHINE for the small businessman is a one-man bookkeeping staff. It is capable of simultaneously producing up to four different sets of documents, tags or forms from a single typing. Working from punched cards, the mechanical bookkeeper does order writing, stock keeping, or an entire billing operation.

Science News Letter, February 26, 1955

DRINKING FOUNTAIN, shown in the photograph, screws directly into outdoor water faucet for hard-playing youngsters, and for gardeners, golfers or picnickers.

Lifting the cup brings up the water, lowering the cup shuts the water off. Coupler is also provided to allow simultaneous use of garden hose and fountain.

Science News Letter, February 26, 1955

PLASTIC PATCHES for used car auto body repairs makes possible a new and easy method for repairing sheet metal with epoxy resins and Fiberglas cloth. The patches are laid on in successive layers of glass cloth and resin and then sanded. Easy-to-use repair kit and materials are claimed to save car owners as much as 70% on repair costs.

Science News Letter, February 26, 1955

FILM TRANSPORT in this imported 35 mm camera is fully automatic. A side lever, when flipped, transports the film, counts the exposure, sets the shutter, prevents double-exposure, making the camera ready to use. Camera fans can now shoot picture after picture without moving this precision-made camera away from their eye.

Science News Letter, February 26, 1955

SPRAY-ON adhesive has a variety of uses from sealing packages to repairing shoes. Aerosol spray container with 11 ounces of the rubber-resin glue can coat 250 square feet of surface. The waterproof adhesive is resistant to soap and water cleansing, but dissolves readily in dry-cleaning solutions.

Science News Letter, February 26, 1955

WEED KILLER PELLET is a new handy-to-use form of 2,4-D. Each pellet makes one pint of proper-strength solution for treatment in the garden against such broad-leaved lawn weeds as dandelions, plantain and chickweeds.

Science News Letter, February 26, 1955

THE CHEMISTRY WE USE

a compilation of "Home Lab" experiments, a monthly feature of CHEMISTRY magazine. Written by Burton L. Hawk . . . and designed for a simple but adequate home laboratory in which real chemical preparations can be made.

The World We Live In
The Air We Breathe
The Water We Drink
The Food We Eat
The Clothing We Wear
The Coins We Spend
The Drugs We Take
Lesser-Known Elements We Study
Other Materials We Use

A PRACTICAL INTRODUCTION TO THE CHEMISTRY OF EVERYDAY THINGS

To: SCIENCE SERVICE
1719 N St., N. W.
Washington 6, D. C.

Mail to me at my address as imprinted to the left:

_____copies of THE CHEMISTRY WE USE, cloth bound @ $2 each.

Am't enclosed $_____

Please bill me ( )

2-26-5

Do You Know?

Yellowstone National Park contains more *geysers* than the rest of the world together.

Baby chicks should be brooded as far away from other birds, including mature free-flying birds, as possible.

The United States aircraft industry spent $4,000,000,000 for subcontracting, materials, fuel, and for electricity used in *airplane manufacture.*

The smallest, and probably the oldest, producing *pig iron* furnace in the United States is near Wrigley, Tenn.; its hearth diameter is only seven feet, four inches.

When a major *artery* is blocked by a clot, as in acute forms of arterial disease, introducing a vein graft by surgery to bypass the blocked area may restore circulationtion to the area which had its blood supply impaired.

Science News Letter, February 26, 1955